Customized FORM PTO-1390 U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE

TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371

ATTORNEY DOCKET NO.	U.S. APPLICATION NO. (If known, see 37 CFR 1.5)
P07204US00/WEJ	09/831705

INTERNATIONAL APPLICATION NO.	INTERNATIONAL FILING DATE	PRIORITY DATE CLAIMED
PCT/FI98/00881	12.11.98	

TITLE OF INVENTION: ARRANGEMENT IN A GLASS BENDING OVEN

APPLICANT(S) FOR DO/EO/US: PELTONEN

Applicant herewith submits to the US Designated/Elected Office (DO/EO/US) the following items and other information:

X 1. This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.

☐ 2. This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 USC 371.

X 3. This express request to begin national examination procedures (35 USC 371(f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 USC 371(b) and PCT Art. 22 and 39(1).

X 4. A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.

X 5. A **copy** of the International Application as filed (35 U.S.C. 371 (c)(2))

- ☐ a. is transmitted herewith (required only if not transmitted by the International Bureau).
- X b. has been transmitted by the International Bureau.
- ☐ c. is not required, as the application was filed in the United States Receiving Office (RO/US).

☐ 6. A **translation** of the International Application into English (35 U.S.C. 371(c)(2)).

X 7. Amendments to the claims of the International Appln. under PCT Article 19 (35 USC 371 (c)(3))

- ☐ a. are transmitted herewith (required only if not transmitted by the International Bureau).
- ☐ b. have been transmitted by the International Bureau.
- ☐ c. have not been made; however, the time limit for making such amendments had NOT expired.
- X d. have not been made and will not be made.

☐ 8. A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).

X 9. An **oath** or declaration of the inventor(s) (35 U.S.C. 371(c)(4)).

☐ 10. A translation of the annexes to the Int'l Prelim. Exam. Report under PCT Article 36 (35 U.S.C. 371(c)(5)).

Items 11. to 20. below concern document(s) or information included:

☐ 11. An **Information Disclosure Statement** under 37 C.F.R. 1.97 and 1.98.

☐ 12. An **Assignment** document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.

X 13. A **First preliminary amendment.**

☐ 14. A Second or Subsequent preliminary amendment.

☐ 15. A substitute specification.

X 16. A change of power of attorney and/or address letter.

☐ 17. A computer-readable form of the sequence listing in accordance with PCT Rule 13ter.2 & 35 USC 1.821-825.

☐ 18. A second copy of the published international application under 35 USC 154(d)(4).

☐ 19. A second copy of the English translation of the international application under 35 USC 154(d)(4).

☐ 20. Other items or information:

☐

☐

☐ A copy of the Notification of Missing Requirements under 35 U.S.C. 371.

X In the event that a petition for extension of time is required to be submitted herewith, and in the event that a separate petition does not accompany this response, applicant hereby petitions under 37 CFR 1.136(a) for an extension of time of as many months as are required to render this submission timely. Any fee is authorized in 17(c).

Date: 14 May 2001

LARSON & TAYLOR, PLC • 1199 North Fairfax St. • Suite 900 • Alexandria, VA 22314

U.S. APPLICATION NO. (If known) 09/831705	INTERNATIONAL APPLICATION NO. PCT/FI98/00881	ATTORNEY DOCKET NO. P07204US00/WEJ

		CALCULATIONS *PTO USE ONLY*
X	21. **The following fees are submitted:**	
X	**Basic National Fee** (37 CFR 1.492 (a) (1)-(5):	
X	Neither Int'l Prelim. Exam. fee nor Int'l Search fee paid to USPTO $1000	
☐	Search Report has been prepared by the EPO or JPO $ 860	
☐	No Int'l Prelim. Ex. fee paid to USPTO but Int'l Search fee paid to USPTO $ 710	
☐	International preliminary examination fee paid to USPTPO $ 690	
☐	Int'l Prelim. Ex. fee paid to USPTO & all claims satisfied PCT Art. 33(1)-(4) $ 100	
	ENTER APPROPRIATE BASIC FEE AMOUNT =	$ 1000.00
☐	Surcharge of **$130** for furnishing the oath or declaration later than ☐ 20 mos. ☐ 30 mos. + from the earliest claimed priority date (37 CFR 1.492(e)).	$

CLAIMS	*NUMBER FILED*	*NUMBER EXTRA*	*RATE*	
Total Claims	6 - 20 =	0	X **$18** =	$
Independent Claims	1 - 03 =	0	X **$80** =	$
☐ Multiple Dependent Claim(s) (if applicable)			+ **$270** =	$
			TOTAL OF ABOVE CALCULATIONS =	$ 1000.00
X	Applicant claims small entity status. See 37 CFR 1.27. The fees indicated above are reduced by ½.		-	$ 500.00
			SUBTOTAL =	$ 500.00
☐	Processing fee of **$130** for furnishing the **English translation** later than ☐ 20 mos. ☐ 30 mos. + from the earliest claimed priority date (37 CFR 1.492(f)).			$
			TOTAL NATIONAL FEE =	$ 500.00
☐	Fee for recording the enclosed **assignment** (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). **$40** per property		+	$
			TOTAL FEES ENCLOSED =	$ 500.00
			Amount to be Refunded	$
			Amount to be Charged	$

X a. A **check** in the amount of $ 500.00 to cover the above fees is enclosed.

☐ b. Please charge my Deposit Account No. 12-0555 in the amount of $ to cover the above fees.

X c. The Commissioner is hereby authorized to charge any additional fees required or credit overpayment to Deposit Account No. 12-0555.

Note: *Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.*

SEND ALL CORRESPONDENCE TO:

William E. Jackson

At the address (below) of **CUSTOMER NO. 00881.**

LARSON & TAYLOR, PLC
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SUITE 900
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SIGNATURE: Douglas E. Jackson

NAME: Douglas E. Jackson

REG. NO.: 28,518

PHONE NO.: 703-739-4900

Date: 11 May 2001

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Patent

In re patent application of: PELTONEN

Serial No.: New U.S. Application — Examiner:

Filed: May 14, 2001 — Art Unit:

For: ARRANGEMENT IN A GLASS BENDING OVEN — Docket No.: P07204US00/WEJ

PRELIMINARY AMENDMENT

Assistant Commissioner for Patents
Washington, D.C.

S I R:

Prior to examination, please amend the above-identified application as follows.

IN THE CLAIMS

A clean version of amended claims is provided herewith in **Attachment A**. It will be noted that claims 3-6 have been amended relative to the previously provided version as shown by the marked up version thereof in **Attachment B** provided herewith.

REMARKS

By this Amendment, the claims have been rewritten to reduce the multiple dependencies.

Further and favorable action is solicited.

Respectfully submitted,

Date: 14 May 2001

By: Douglas E. Jackson
Douglas E. Jackson
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ATTACHMENT A

Clean Replacement/New Claims

Following herewith is a clean copy of each claim which replaces each previous claim having the same number.

3. (Amended) An arrangement according to claim 1 characterized in that the moulds are collected with the transmitters from lower part (4) of lift section (1) and returned there.

4. (Amended) An arrangement according to claim 1 characterized in that to lift section (10) of lower rail (4) the mould carriage (8) is guided from the former section 2a by means of separate steering regardless of the transmission cycle of other carriages.

5. (Amended) An arrangement according to claim 1 characterized in that to lift section (1) of lower rail (4) the mould carriages (8) are guided from former section (2a) and the preceding section (2b) by means of separate steering regardless of the transmission cycle of other carriages.

6. (Amended) An arrangement according to claim 1 characterized in that each mould in its turn is moved off rail (4) in the furnace for a substantially longer time than the duration of one cycle of the said rail.

ATTACHMENT B

Marked Up Replacement Claims

Following herewith is a marked up copy of each rewritten claim.

3. (Amended) An arrangement according to ~~claims 1 and 2~~ claim 1 characterized in that the moulds are collected with the transmitters from lower part (4) of lift section (1) and returned there.

4. (Amended) An arrangement according to ~~any of the previous claims 1-3~~ claim 1 characterized in that to lift section (10) of lower rail (4) the mould carriage (8) is guided from the former section 2a by means of separate steering regardless of the transmission cycle of other carriages.

5. (Amended) An arrangement according to ~~any of the previous claims 1-3~~ claim 1 characterized in that to lift section (1) of lower rail (4) the mould carriages (8) are guided from former section (2a) and the preceding section (2b) by means of separate steering regardless of the transmission cycle of other carriages.

6. (Amended) An arrangement according to ~~any of the previous claims 1-5~~ claim 1 characterized in that each mould in its turn is moved off rail (4) in the furnace for a substantially longer time than the duration of one cycle of the said rail.

ARRANGEMENT IN A GLASS BENDING OVEN

This invention relates to an arrangement in a glass bending furnace in accordance with the preamble of claim 1 by means of which arrangement formation of glass sheet unloading and glass sheet loading times are prevented as capacity restricting factors.

Previously known are so called serial type bending furnaces, where the glass sheets move for bending on the upper rail and the bent ones back to the loading and reloading place along the lower rail either in carriages with side walls or in open carriages. In these arrangements both the removal of a bent glass sheet and placing a straight blank in the mould are carried out while said carriage is standing still in the lower part of the so called loading lift.

The circulation time of carriage vertical motions including horizontal motions, lift motions, function of side members etc. typically take ab. 30 sec. Then the carriage is immobile in the lower part of said loading lift depending on the capacity of furnace each time. For instance, at a capacity of n pieces/h the time of standing still is (3600 sec)/n - 30 sec.

If, for instance, the required furnace capacity is 60 pieces/h, then there will remain altogether 30 sec time (= 15 sec. + 15 sec.) for unloading and loading. In this case loading and unloading can still be carried out successfully by experienced persons, but two persons would be needed.

However, if one wants to increase the capacity to a quantity of 100 pieces/h, for instance, the so called cycle length will be 36 sec. and altogether 36 sec. - 30 sec. = 6 sec. time will remain for loading and unloading, the job is then impossible.

The arrangement as per this invention eliminates the top limit of lifting capacity caused by the loading and unloading procedures.

Characteristic for the invention is what is presented in the claims.

By means of the arrangement one is not tied to the cycle length in the manner that unloading from and loading into the mould carriage should be carried out within that time. Thanks to the arrangement the capacity of furnace can be increased substantially from known rates of 30 - 70 pieces per hour in present serial furnaces to a rate of 100 - 120 pieces per hour. By means of the arrangement both bent glass sheets and straight glass sheets to be loaded into the furnace are more easily handled than the ones today, because the moulds are better pulled forward for the period of glass sheet replacement in a special workplace for glass sheet changing.

In the following the invention is disclosed with reference to the enclosed drawing, where

Fig. 1 is a schematic side view of a furnace embodiment.

Fig. 2 is schematic view of a furnace embodiment from above furnished with the arrangement as per this invention.

Figure 1 shows a serial furnace from one side, which has an upper rail 3 and an lower rail 4. Glass sheet 9 for bending travels in mould carriage 8 on the upper rail from section 2a to another section 2b, 2 c etc. On the upper rail the glass sheet is heated up to bending temperature. On the lower rail bent glass sheets 10 travel in mould carriage 8 via cooling sections to the unloading and loading end, which comprises also the lift section. Other sections on top of one another are marked with section numbers 2a, 2b, 2c etc. During the cycle of the process each mould carriage 8 stops in the respective section. The cycle includes the transmission time of one carriage and the stop time of one carriage.

Figure 2 shows the furnace from above. On lower rail4 bent glass sheets 10 travel in mould carriages 8 in turns to section 2a. In the embodiment of figure 2 from section 2a lower rail the mould

with bent glass sheet 10b is shifted over to lift section 1, when carriage 8a with straight glass sheet 9d in the mould has been first elevated by the lift to upper rail 3. When glass sheet 10b and mould carriage 8b are on the lift section lower rail, the transmitter, whose turn it is, e.g. device 5, collects glass sheet 10b and the mould pulling them to the side station onto transmitter 5. The bent glass sheet10 is removed into pile 10. A straight glass sheet from pile 9 is mounted in the mould as replacement.

In the meantime transmitter 6 brings the mould and new glass sheet 9e to mould carriage 8b. Carriage 8b is elevated by the lift and the arrangement is ready to receive and move the next mould carriage 8c to section 1 regardless of whether on the rail a transmission cycle is unfinished or not. Transmitter 6 that has lastly brought a glass sheet takes the from first at section 1 arrived carriage 8c a mould and a glass sheet 10c and pulls the glass sheet aside for replacement.

Now mould carriage 8c is empty in section 1 and transmitter 5 brings the mould and a new glass sheet 9f into it. As soon as carriage 8c is elevated by the lift, mould carriage 8d, arrived at least at section 2b during the transmission cycle, is moved to section 1 and transmitter 5 picks up mould and glass sheet 10d. The transmitter that has lastly brought the mould and straight glass sheet to section 1, also takes the next at the section arrived bent glass sheet for transmission to the respective side station. By means of this arrangement the transmitters can, each in its turn, keep each mould aside for a longer time for glass sheet replacement.

In figure 1 section 2b is empty on the lower rail at the moment shown. One advantageous embodiment of the invention is that from section 2c the mould carriage travels forward still steered by the transmission cycle, i.e. pushed by the other carriages, but the carriage arrived at sections 2a and 2b or at least at section 2a is steered forward regardless of the transmission cycle. These

carriages are moved in turns to lift section 1 substantially at once when the lift section is empty. When in the arrangement at least one section 2a or 2b on the lower rail is purposely empty, the next carriage , for instance 8d, can freely enter the empty section not causing any forced transmission to the lift section in the arrangement as per this invention.

In the arrangement according to the invention there is one mould more than mould carriages 8. The extra mould (each mould in its turn) is in the side station, whereby in the unloading and loading situation the mould to be returned from the side station has no access back to the same carriage by which it was brought to the station. Thanks to the extra mould there is a remarkable increase of available unloading and loading time. If there is an even number of moulds, the glass sheet will return to the same side of the furnace from where it was taken to the furnace. This is important by mixed production with respect to storing and order.

In the following an example of a furnace, the capacity of which has been raised to a quantity of 100 pieces per hour by means of the arrangement of this invention.

Cycle length is	3600 sec./100 pieces = 36 sec. each
Loading lift up, time expenditure	4,5 sec.
Carriage into loading lift	4,5 sec.
Glass sheet collection	10 sec.
Glass sheet in	10 sec.
	Total 29 - 30 sec.

Glass sheet change is 2 x cycle length - above transmission times, i.e 72 sec. - 30 sec. = 42 sec.
In the side station on each side one has 42 sec. time to change glass sheet in the immobile mould. So there is more time than the cycle duration.

It is to be noticed that the time needed for moving the carriages

from one section to another needs not to be taken into consideration.

Most suitably transmitters 5 and 6 are fork trucks with forks lifting the mould and taking it to the side station. The side stations comprised in this invention bring about a remarkable growth of capacity. The furnace construction includes a control centre 11 to steer the furnace operation. Among other things, the control of the timing of transmitter 5 and 6 functions can be made automatic and synchronous with the shit over of mould carriages from section 2a to section 1.

CLAIMS

1. An arrangement in the unloading and loading end of a multi-section glass bending furnace, especially in such a furnace, where the glass sheets (9),(10) travel along a special rail (3),(4) from one furnace section to the next section in mould carriages (8) moving in cycles on the said rail, the rail being arranged to circulate through the bending section and to return to the loading and unloading end, c h a r a c t e r i z e d in that

- for loading and unloading operations in carriage (8) locating mould with the bent glass (10) resting on it is shifted from rail (4) over to the first side station and from the second side station the mould including the glass sheet(9) is shifted over into said carriage, while the carriage keeps moving forward on rail (4),
- the first and second side station are located on different sides of lift section (1) and in each side station the bent glass sheet (10) is removed from the mould and a new glass sheet (9) is mounted into the mould, and that
- a mould transmitter (5),(6) in both side stations collects the moulds from one and the same loading section (1) and returns the moulds to the same section.

2. An arrangement according to claim 1 c h a r a c t e r - i z e d in that the number of moulds is greater than the number of mould carriages (8).

3. An arrangement according to claims 1 and 2 c h a r a c t e r- i z e d in that the moulds are collected with the transmitters from lower part (4) of lift section (1) and returned there.

4. An arrangement according to any of the previous claims 1 - 3 c h a r a c t e r i z e d in that to lift section (10) of lower rail(4) the mould carriage (8) is guided from the former section 2a by means of separate steering regardless of the transmission cycle of other carriages.

5. An arrangement according to any of the previous claims 1 - 3 c h a r a c t e r i z e d in that to lift section (1) of lower rail(4) the mould carriages (8) are guided from former section (2a) and the preceding section (2b) by means of separate steering regardless of the transmission cycle of other carriages.

6. An arrangement according to any of the previous claims 1 - 5 c h a r a c t e r i z e d in that each mould in its turn is moved off rail (4) in the furnace for a substantially longer time than the duration of one cycle of the said rail.

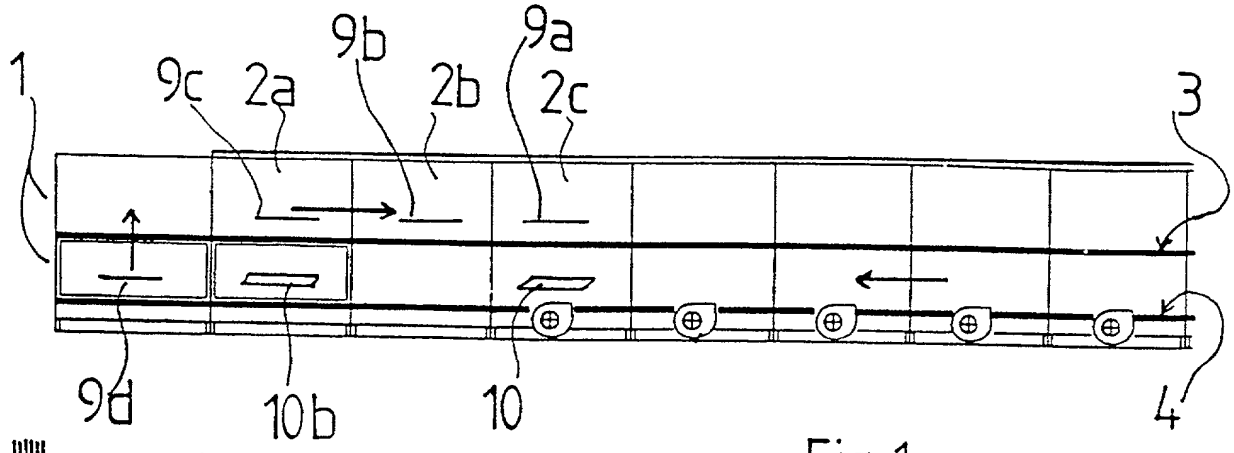
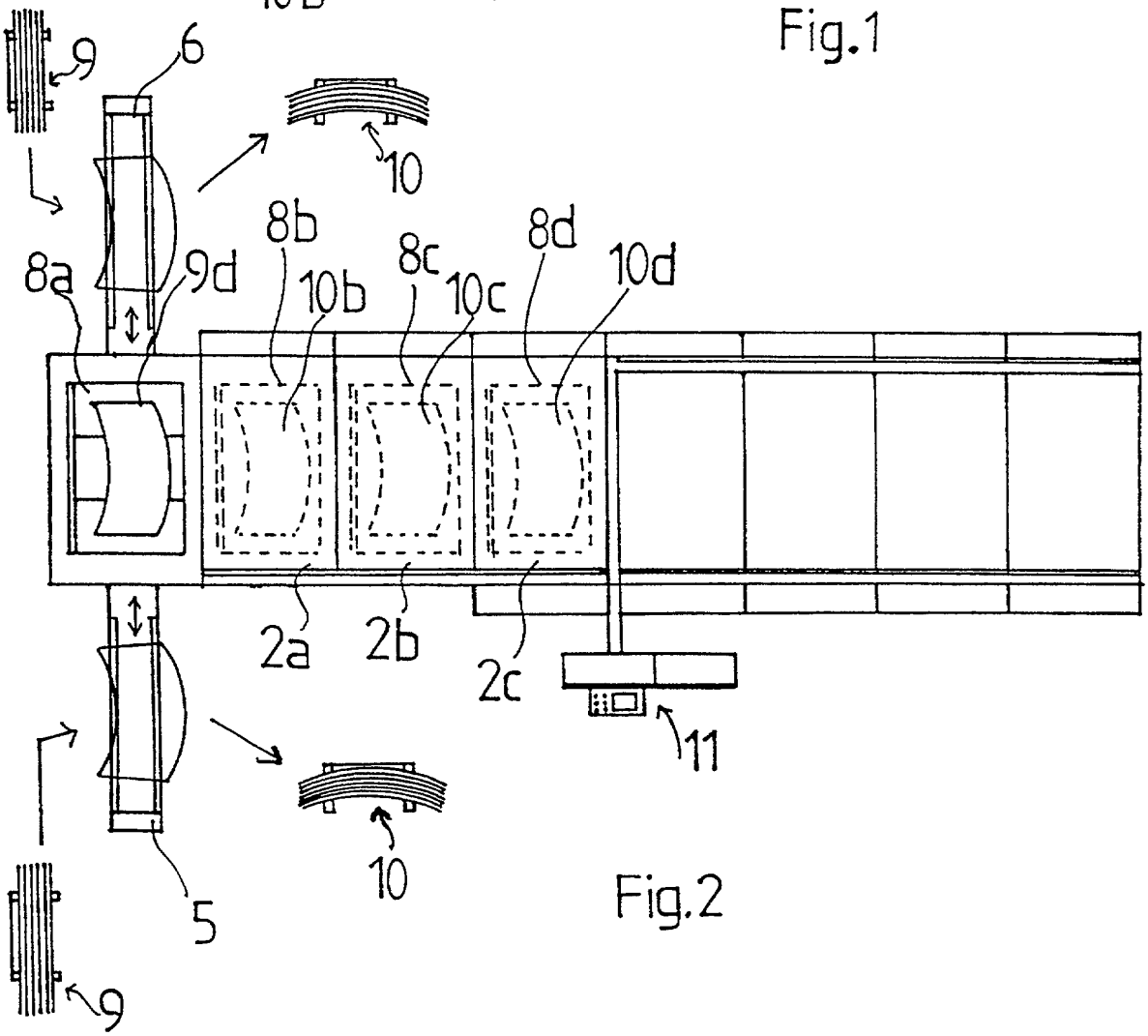

1
9c
2a
9b
2b
9a
2c
3
9d
10b
10
4

Fig.1


9
6
10
8b
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9d
10b
8c
10c
8d
10d
2a
2b
2c
11
10
5
9

Fig.2

DECLARATION FOR USA PATENT APPLICATION

(including Design and National Stage PCT) Attorney's Docket ID: _____

As a below named inventor, I hereby declare that:
My residence, post office address and citizenship are as stated below adjacent to my name. I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled ARRANGEMENT IN A GLASS BENDING OVEN

_____, the specification of which

XX is attached hereto. (or)

___ was filed on _____, [ ] and was amended on _____.

[ ] as U.S. Application No. _____ or

[X] as International PCT Application No. PCT/FI98/00881

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above. I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations, § 1.56.

I hereby claim foreign priority benefits under Title 35, United States Code, § 119 (a) - (d) or §365 (b) of any foreign application(s) for patent or inventor's certificate, or §365 (a) of any PCT International application which designated at least one country other than the United States of America, listed below and have also identified below, where priority is not claimed, any foreign application for patent or inventor's certificate, or any PCT International application, having a filing date before that of the application on which priority is claimed:

Prior Foreign Application(s) (____ ADDITIONAL APPLICATIONS IDENTIFIED ON ATTACHED SHEET):

Number	Country	Day/Month/Year Filed	Priority Not Claimed

I hereby claim the benefit under Title 35, United States Code, § 120 of any United States application(s), or §365(c) of any PCT International application designating the U.S., listed below, and insofar as the subject matter of each claims of this application is not disclosed in the prior United States or PCT International application in the manner provided by the first paragraph of Title 35, United States Code, § 112, I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations § 1.56 which became available between the filing date of the prior application and the national or PCT International filing date of this application. (___ ADDITIONAL APPLICATIONS IDENTIFIED ON ATTACHED SHEET.)

Application Serial No.	Day/Month/Year Filed	Status – patented, pending, abandoned

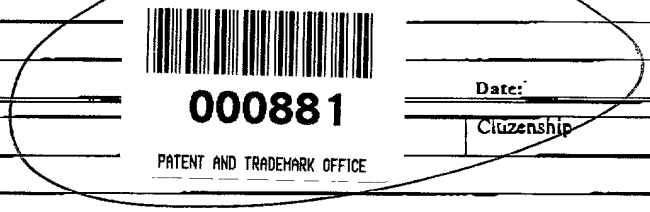
I hereby appoint the practioners of LARSON & TAYLOR associated with the Customer Number provided below to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith, and direct that all correspondence be addressed to that Customer Number.

CUSTOMER NUMBER:

Direct all telephone calls to _____, at TEL (703) 739-4900 (Fax: 703-739-9577)

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under § 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Full Name of Sole or First Inventor	PELTONEN, Esko	Citizenship Finland
Full Post Office Address	Rahkakuja 2, FIN-36220 KANGASALA, FINLAND	FIX
Residence - City, State/Country (if different from P.O. address)	same as above.	
SIGN AND DATE HERE: Inventor's Signature:		Date: 04 May 2001
Full Name of Second Joint Inventor, if any		Citizenship
Full Post Office Address		
Residence - City, State/Country (if different from P.O. address)		
SIGN AND DATE HERE: Inventor's Signature:		Date:
Full Name of Third Joint Inventor, if any		Citizenship
Full Post Office Address		
Residence - City, State/Country (if different from P.O. address)		
SIGN AND DATE HERE: Inventor's Signature:		Date:
Full Name of Fourth Joint Inventor, if any		Citizenship
Full Post Office Address		
Residence - City, State/Country (if different from P.O. address)		
SIGN AND DATE HERE: Inventor's Signature:		Date:



___ SEE ATTACHED SHEET FOR SIMILAR INFORMATION AND SIGNATURE FOR ADDITIONAL JOINT INVENTORS.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Patent

In re patent application of: PELTONEN

Serial No.: New U.S. Application

Filed: May 14, 2001

For: ARRANGEMENT IN A GLASS BENDING OVEN

Examiner:

Art Unit:

Atty. Docket No.:
P07204US00/WEJ

CHANGE OF CORRESPONDENCE ADDRESS
CUSTOMER NUMBER DESIGNATION

Honorable Assistant Commissioner for Patents
Washington, D.C.
S I R:

Henceforth, please **change the correspondence address** of the above identified application to the correspondence address associated with the CUSTOMER NUMBER identified below, or to the (same) correspondence address shown below if the Customer Number designation cannot be used.

LARSON & TAYLOR, PLC
Transpotomac Plaza
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Alexandria, VA 22314

or

CUSTOMER NUMBER
00881

In addition, please also **appoint the practitioners** (of LARSON & TAYLOR, PLC) associated with this Customer Number to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith.

If there is any problem in changing the correspondence, please contact the undersigned immediately by telephone at 703-739-4900.

Respectfully submitted,

Date: 14 May 2001

Douglas E. Jackson

By: Douglas E. Jackson
Registration No.: 28518